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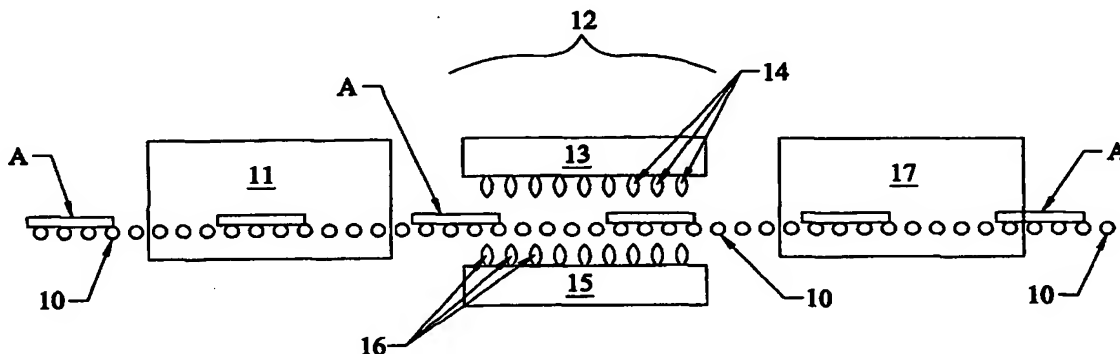
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- (74) Agents: MURATORI, Alfred, H. et al.; MicroCoating Technologies, Inc., 5315 Peachtree Industrial Boulevard, Chamblee, GA 30341 (US).
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09/349,213 2 July 1999 (02.07.1999) GB
- (71) Applicant (for all designated States except US): MICRO-COATING TECHNOLOGIES, INC. [US/US]; 5315 Peachtree Industrial Boulevard, Chamblee, GA 30341 (US).
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- Published:  
— With international search report.
- (72) Inventors; and  
(75) Inventors/Applicants (for US only): HUNT, Andrew, Tye [US/US]; 495 Mountain Way, Atlanta, GA 30342 (US). MCENTYRE, John, Eric [US/US]; 3729 Kinnard Drive, Atlanta, GA 30360 (US). NEUMAN, George, Andrew [US/US]; 111 Saint Martin Drive, Suwanee, GA 30024 (US). VINSON, Matthew, Scott [US/US]; 9113 Madison Drive, Atlanta, GA 30346 (US).
- (88) Date of publication of the international search report:  
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- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: METHOD OF COATING CERAMICS USING CCVD



(57) Abstract: Methods for producing coatings on a glass substrate using combined chemical vapor deposition or other heat concentrated deposition (CHD) techniques. The term "glass" in this context is defined as those materials that crack, break or are otherwise damaged prior to plastic deformation of the material. In combustion chemical vapor deposition CCVD, a reagent and a carrier solution are mixed together to form a reagent mixture. The reagent mixture is then ignited to create a flame (14, 16), or alternatively, the reagent mixture may be fed to a plasma torch or other heat source. The combustion source may vaporize at least part of the reagent, the vapor phase of the reagent contacting the surface of the substrate (A) to be coated. In this manner, a film or coating is formed on the glass substrate (A). In some of the disclosed methods, the glass substrate (A) may be preheated, to avoid differential heating of the glass by the combustion source. Various methods of reducing the differential heating are disclosed. This differential heating may cause thermal shock or breakage of the glass substrate (A).

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C23C16/453 C23C16/513 C23C16/46

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C23C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 709 487 A (AT & T CORP) 1 May 1996 (1996-05-01)  page 3, line 11-29 page 4, line 34-57 page 5, line 8-14 page 6; table 1  ---	1-3,5,6, 9,10, 17-23, 30,31,47
X	WO 99 29917 A (CHANG ISAAC TSZ HONG ;CHOY KWANG LEONG (GB); IMPERIAL COLLEGE (GB)) 17 June 1999 (1999-06-17)  page 2, line 2-7 page 3, line 17-32 page 4, line 25-29  ---  -/--	1,10,14, 17-19, 23,25, 28,30

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.

## \* Special categories of cited documents :

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

- "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- "&" document member of the same patent family

Date of the actual completion of the international search

20 October 2000

Date of mailing of the international search report

23 January 2001

Name and mailing address of the ISA

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PCT/JS 00/18163

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	EP 0 491 521 A (FUJITSU LTD) 24 June 1992 (1992-06-24)  page 3, line 7-25 page 6, line 8,9 page 4, line 30-32 ---	1,3,11, 17-19, 28,30, 31,47
X,P	EP 0 976 847 A (MICROCOATING TECHNOLOGIES INC) 2 February 2000 (2000-02-02)  column 5, line 1-9 column 14, line 23-38 column 15, line 1-11 column 10, line 24-28 column 11, line 23-48 -----	1-10,13, 17-19, 23-29,47

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# INTERNATIONAL SEARCH REPORT

Ir. International application No.  
PCT/US 00/18163

## Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
  
2. ☒ Claims Nos.: 41,42  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:  
see FURTHER INFORMATION sheet PCT/ISA/210
  
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
  
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
  
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
  
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  
1 - 42, 47

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 41,42

Product claims 41 and 42 do not contain any structural features which would define the claimed product. In fact said claims only relate to a way of using a deposition method for obtaining said products, rather than clearly defining them in terms of their structural features. The intended limitations are therefore not clear from these claims, which renders a search meaningless.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-42,47

A method for depositing a coating on a substrate, comprising the steps of

-providing at least one heat source for depositing said coating on said substrate and for heating a section of said substrate

-moving said substrate or said at least one heat source relative to each other such that said substrate is not damaged by said heat source

2. Claims: 43-46

Method for coating a substrate with a thin, multi-layer or thick film having specific properties by maintaining the temperature of the substrate such that the resulting coating has the specific properties throughout the entire thickness of the coating.

INTERNATIONAL SEARCH REPORT  
Information on patent family members

International Application No  
PCT/US 00/18163

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